Integrated Excavation Control System

Fernald Environmental Management Project
In Partnership with the Office of Science & Technology

Introduction

Fernald will begin remediation of soils and at- and below-grade portions of structures in the sites' former Production Area in FY2001. This effort will be technically the most difficult portion of such remediation at Fernald, as well as the largest. In addition, remediation of he subsurface soils in the site's Waste Pit Area will begin in FY2008.

The DOE's Office of Science and Technology has partnered with Fernald in an Accelerated Site Technology (ASTD) to deploy technologies to assist in the cleanup efforts at Fernald's former Production Area and Waste Pit Area.

The overall objective of this ASTD project is the successful implantation and subsequent redeployment of an Integrated Excavation Control System (IECS). The system will:

- Expand and enhance the Fernald Environmental Management Project (FEMP) capabilities for the in-situ measurement of radionuclide concentrations in soil in locations in with current approaches cannot be used.
- Allow estimates of excavated soil volumes to be made rapidly.
- Minimize wastes generated during soil excavation.

Technical Need

A number of specific improvements are needed that build on and extend the FEMP's current efforts. These needed improvements are the following:

- The ability to provide complete topographic information on the excavation on a daily basis so that accurate estimates of excavated volumes are available rapidly
- The ability to achieve safe access to all locations for in-situ data obtained in certain excavation geometries
- The ability to integrate all available data in a cost-effective manner to minimize waste generation.

System Description

Two technologies are proposed for use. The first is survey-grade GPS or laser positioning system (PLS) technology, which will allow the three-dimensional determination of positions in the field that are needed for accurate volume estimates. The second is the Excavation Monitoring System (EMS), which will allow in-situ measurements of radionuclide concentrations in soils to be made in more complex situations than has been necessary at Fernald to date.

Excavation Monitoring System

Benefits

Deployment of the IECS at the FEMP will reduce the costs associated with determination of radionuclide concentrations in soils in deep excavations and ditches. Costs associated with civil surveys necessary to determine the volume of excavated soils will also be reduced. Cost for the off-site disposal of wastes will be reduced. The

ability to manage soil excavation efforts will be improved. Also, risks to workers will e reduced because the need for workers to enter deep excavations or contaminated areas will be minimized. The estimated cost savings associated with the use of the IECS is about $5.4 million.

Status

After the completion of acceptance testing, it was determined that minor hardware and software modifications were needed. Plans have been developed to prioritize and complete the modifications that were identified during the acceptance testing. Work on these items is underway. These modifications are scheduled for completion by early December 2001. Project personnel are confident that the Excavation Monitoring System (EMS) will be fully operational in the spring of 2002 for the start of the full-scale excavation in Area 3A.

Project Funding (in Thousands)

Funding Source	FY99	FY00	FY01
OST	$435	$250	0

For more information about deployment of the Mobile Work Platform at the Fernald Environmental Management Project, contact:

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